

## CLAIMS

1. An apparatus for checking hollow helicopter blade pressure, comprising:

pressure sensor means; and

a pressure-tight fluid line having a first end and a second end, wherein said first end being connected to said pressure sensor means and said second end being connected to an inlet valve of a hollow helicopter blade,

whereby said pressure-tight fluid line forms a passageway between said pressure sensor means and the hollow helicopter blade allowing high pressure gas to flow between said pressure sensor means and the hollow helicopter blade.

2. The apparatus as defined in claim 1, wherein said pressure sensor means is a digital pressure sensor.

3. The apparatus as defined in claim 2, wherein said pressure sensor means is powered by a power source.

4. The apparatus as defined in claim 3, wherein said power source is a battery.

5. An apparatus for filling a hollow helicopter blade, comprising:

pressure sensor means;

a first pressure-tight fluid line having a first end and a second end, wherein said first pressure-tight fluid line being connected at said first end to said pressure sensor means and being connected at said second end to the hollow helicopter blade; and

a second pressure-tight line having an inlet end and a outlet end, said second pressure-tight line being connected at

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said inlet end to a gas supply and being connected at said outlet end to said first pressure-tight fluid line.

6. The apparatus as defined in claim 5, further comprising a pressure control valve connected to said second pressure-tight line to regulate flow of pressurized fluid from the gas supply to the hollow helicopter blade and said pressure sensor means.

7. The apparatus as defined in claim 6, further comprising a relief valve connected to said pressure control valve to prevent over-pressurization.

8. The apparatus as defined in claim 7, wherein said relief valve comprises a vent.

9. The apparatus as defined in claim 6, wherein said pressure sensor means is a digital pressure sensor.

10. The apparatus as defined in claim 9, wherein said pressure sensor means is powered by a power source.

11. The apparatus as defined in claim 10, wherein said power source is a battery.

12. The apparatus as defined in claim 7, further comprising a check valve disposed in said second pressure-tight fluid line between said pressure control valve and said first pressure-tight fluid line, whereby back flow from the hollow helicopter blade to said pressure control valve is prevented.

13. The apparatus as defined in claim 6, further comprising an ambient temperature gauge.

14. A method for checking hollow helicopter blade pressure, comprising the steps of:

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- (a) connecting one end of a pressure-tight fluid line to an inlet valve of a hollow helicopter blade and the other end of the pressure-tight fluid line to a digital pressure sensor;
- (b) opening the inlet valve of the hollow helicopter blade allowing the higher than ambient pressure fluid to flow between the hollow helicopter blade and the digital pressure gauge; and
- (c) monitoring internal pressure of the hollow helicopter blade displayed on the digital pressure sensor to determine whether internal pressure level is sufficient to continue flight operation.

15. A method as defined in 14, further comprising the steps:

- (a) connecting one end of another pressure-tight line connected to a gas supply and its other end to the pressure-tight fluid line;
- (b) starting flow of higher pressure fluid from the gas supply to the hollow helicopter blade;
- (c) monitoring internal pressure of the hollow helicopter blade displayed on the digital pressure sensor to determine when internal pressure level is sufficient to continue flight operation; and
- (d) stopping flow of higher pressure fluid from the gas supply to the hollow helicopter blade when internal pressure of the hollow helicopter blade is sufficient to continue flight operation.

16. A method for checking internal pressure of a hollow helicopter blade, comprising the steps of:

- (a) providing a gas supply and a hollow helicopter blade pressure checking apparatus having a control valve, a digital pressure sensor, a check/fill outlet, and a gas supply connector;

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- (b) allowing the apparatus to stand near the blade for five minutes to equalize apparatus temperature;
- (c) closing the control valve;
- (d) connecting a hose at one end to a gas supply and its other end to the gas supply connector;
- (e) starting flow of higher pressure fluid from the gas supply to the control valve;
- (f) opening the control valve to start flow of higher pressure fluid from the gas supply to a predetermined level to purge the apparatus;
- (g) connecting another hose to a helicopter blade valve and to the check/fill outlet;
- (h) closing the control valve;
- (i) opening the helicopter blade valve;
- (j) observing reading of the digital pressure sensor;
- (k) closing the helicopter blade valve;
- (l) stopping flow of higher pressure fluid from the gas supply to the control valve;
- (m) disconnecting the another hose from the helicopter blade fitting and to the check/fill outlet;
- (n) bleeding residual pressure from the apparatus by opening the control valve for a predetermined time period;
- (o) disconnecting the hose from the gas supply and the gas supply connector; and
- (p) opening the control valve fully.

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17. A method for filling and checking structural integrity of a hollow helicopter blade, comprising the steps of:

- (a) providing a gas supply and a hollow helicopter blade pressure check and fill apparatus having a control valve, a digital pressure sensor, a check/fill outlet, and a gas supply connector;
- (b) allowing the apparatus to stand near the blade for five minutes to equalize apparatus temperature;
- (c) closing the control valve;
- (d) connecting a hose at one end to a gas supply and its other end to the gas supply connector;
- (e) starting flow of higher pressure fluid from the gas supply to the control valve;
- (f) opening the control valve to start flow of higher pressure fluid from the gas supply to a predetermined pressure level to purge the apparatus;
- (g) connecting another hose to a helicopter blade valve and to the check/fill outlet;
- (h) closing the control valve;
- (i) opening the helicopter blade valve;
- (j) observing reading of the digital pressure sensor;
- (k) opening the control valve to start flow of higher pressure fluid from the gas supply to the hollow helicopter blade to a predetermined pressure level;
- (l) closing the control valve after a predetermined time period;
- (m) observing internal pressure of the hollow helicopter blade displayed on the digital pressure sensor;

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(n) closing the helicopter blade valve when the observed internal pressure of the hollow helicopter blade displayed on the digital pressure sensor reached a desirable level;

(o) stopping flow of higher pressure fluid from the gas supply to the control valve;

(p) disconnecting the another hose from the helicopter blade valve and to the check/fill outlet;

(q) bleeding residual pressure from the apparatus by opening the control valve for a predetermined time period;

(r) disconnecting the hose from the gas supply and the gas supply connector; and

(s) opening the control valve fully bringing the internal pressure of the apparatus to ambient conditions.

18. The method as defined in claim 17, wherein the predetermined time period of step (1) is one minute.

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